

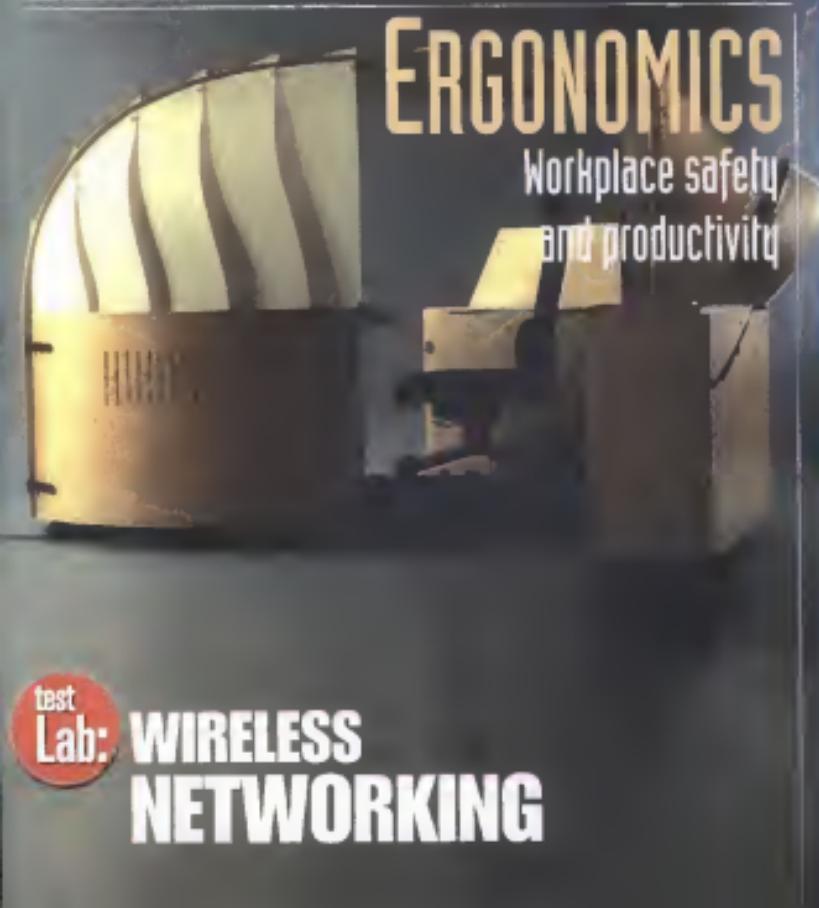
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ERGONOMICS

Workplace safety
and productivity

test
Lab:

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is rechargeable



Tiny camera
captures video



One-touch
multimedia





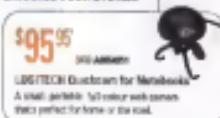
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IN THIS ISSUE

Commentary

- 6 From the Editor
- 8 Letters

New & Notable

- 10 What's New
- 20 Drives, lenses, brighten HP's fall colours
- 25 Microsoft adds US\$400 million to research, development

Ergonomics

- 32 Still hunting after all these years
Plan on the job didn't start with the Computer Age
- 33 Roger's gallery of ergonomic malfeasance
- 34 A healthy computing checklist
- 27 Multimedia tutorial succeeds where Niven Beaton failed
- 30 Mastering the Canadian keyboard
- 35 I can smell I can see!
Our man's search for computer glasses
- 36 Logitech, Microsoft unleash new peripherals

Hands On

- 42 Eat wireless
TCP Lab looks at 802.11b and 802.11a networking
- 42 Bluetooth inches forward
- 54 Rungate DVD offers fee-free timeshift TV
- 56 Some new flat panels from Samsung

Small Office Technology

- 62 Business in hand
Holding the small business case for PDAs
- 62 Assessing the need for e-commerce
- 67 Office Suite Training: Designing forms in Access
- 66 Quick Tips: Excel printing tips

Platform News

- 83 Approaching the classics
Old hardware finds new life with budget-conscious buyers
- 85 Share printers, files between multiple OSes
- 87 Tinker taylor enthusiasts keep early PCs running
- 84 Apple News: A not-so-new writing mate

Online & Connected

- 88 Online story flashes to life
North Vancouver trio puts Flash to test with 24-part epic
- 89 Hi, I can come to the phone right now
Satellite phones and the meaning of 'always connected'
- 92 Whipping your own Web site: Table-like layouts using CSS

Careers & Training

- 95 Finding a job that fits
A guide to career counseling options
- 100 Career Profiles: Hunting for bugs
- 100 Book review: JavaScript + CSS + DOM Magic

Reader Services

- 105 Classified
- 106 Business Directory
- 108 Advertising Index

COMING UP

December 2002

Cover story: WiFi
Lab Test Roundup

Ad deadline: Last day to register: Dec. 12

Publication begins: Dec. 8

January 2003

Cover story: IBM

Lab Test Roundup

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Standards in the making



FROM THE EDITOR

TWO specifications have emerged that may define digital products in the future. But their potential for success couldn't be more different. First is the shoe-in Banan, which is the codename for Intel's next-generation mobile PC platform, announced at the Intel Developer Forum in September. And Codice, spokesman, Doug Cooper, explains:

"We are taking a platform approach with Banan. It will include the CPU, chipset and wireless communications silicon. Bottom line is there are several chips that intelligently work together to get breakthrough performance and battery life."

For wireless connectivity, Intel is betting on both the 11 Mbps "b" and 54 Mbps "n" flavors of IEEE 802.11 by including support for them in Banan. Plus, says Intel, it will have "a solution" to allow simultaneous Bluetooth operation.

To deal with power and performance issues, Banan has four subsections: Advanced Branch Predictor MicroOp Fusion, a Power Optimized Processor System Bus and Dedicated Stack Manager. The first two work together by first predicting what operations a program will execute next depending on its past behavior, and then combining them into a single operation. The advanced power management has more precise control over supplying power to the components that need it. The dedicated stack manager frees the processor to execute program instructions.

All of those enhance performance without a penalty on battery life, says Intel. And what mobile computer user wouldn't like that?

Several conceptual steps away from mobile processor

design, a different kind of standard is being introduced. At the end of September, Olympus America spokesman, Sally Smith Clemons, talked with TCT about a proposed design specification for digital single-lens reflex (SLR) cameras that had just been announced by Olympus and Kodak (with buy-in from Pentax). It's called the Four Thirds System, taking its name from the sensor (measured diagonally) of the image sensor—43 mm, or one and one-third inches—around which the new digital camera design specification is created.

Whereas the monolithic lens can design a new sensor technology and here the rest of the industry more or less fall in line, power and influence in the camera industry is more diffuse. Need, common sense, and vested interests are all vying to enter the Four Thirds debate. The need arises from the somewhat immature state of the digital SLR industry. Look at the 35-mm industry as a contrast. Once everyone agreed on the physical dimensions of the 35-mm frame, the industry could evolve and prosper, with lens manufacturers, camera makers, photofinishers, and accessory makers all confident their products would be interoperable.

Another benefit of everyone agreeing to the basic film dimension was a common language for optics. Three 24 mm lenses from three separate manufacturers would give roughly the same field of view, making it easier for the industry and consumers to relate to various wide angle and telephoto lens specifications.

With digital SLRs, that common language hasn't been achieved because manufacturers use sensors of different sizes, plus many are using bodies and lenses originally designed for 35

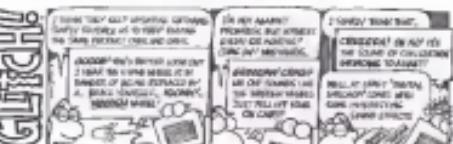
mm film. Anyone who's contemplated a digital SLR has probably discovered that the "normal" 50-mm lens suddenly becomes a 26-something mm lens because the image sensor on the digital SLR is smaller than a 35-mm film frame, so a multiplier factor of 1.5 or 1.6 has to be applied when determining the focal length. Adopting a standard like the Four Thirds System seems like a common sense solution to a potentially confusing situation.

But then the waded mists come in. The fact is that camera makers have a sizable investment in the 35-mm system, plus Nikon and Canon in particular, have a huge and influential installed base of professional or semi-pro 35-mm users. These cameras already have thousands and perhaps tens of thousands of dollars invested in lenses, flash systems and other accessories, plus years invested in learning to use these tools. Asking them to throw that all away just to go digital seems like market suicide.

Moreover, some camera makers have already announced digital SLR models that use a sensor which is the same size as 35-mm film. This preserves the legacy of the 35-mm format while bringing it into the digital era.

Conclusion? Expect Banan everywhere. You may have to look harder for Four Thirds.

David Tanaka, Editor



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< COMMENTARY >

A small detail missing in Red Hat review

Steve Williams has left one small item out of his review of Red Hat Linux 7.3 (see TCA Sept). Is in the Linux community, Red Hat

has lost the support it used to have and with its newer distributions after 7.3, it has been regarded as not worth getting.

I am not going to get into naming the distribution that is the "best" as that really depends on what you use it going to be. Debian and freeBSD are closer to a true Linux kernel than most (except for commercial servers). The rest have various points going for them.

Douglas Greenlee

You, what about the high cost of ink?

In the Lab Report sidebar "Why Ink Costs So Much" (see TGP September) there was no mention of the costs of developing or producing the inks. Nor any mention of the secondary market for ink supplies.

I used to have a Canon colour printer with four separate ink cartridges. After a couple of years of buying expensive cartridges, I tried not refilling my own car-

tridges. This worked for about three refills, and then my print head nozzles started to drag and I could not use them.

I replaced the Canon with an Epson 800 that I got at Superstore. I have bought Epson ink cartridges for several years and they have worked fine. Recently Superstore switched to another cartridge supplier with ink cartridges that are half the price. I am in my first cartridge from this supplier. I am only about a third of the way through the cartridge but have noticed that I have to clean my heads more often.

The Computer Paper could review this and get to the bottom of the quality versus price, OEM versus third-party supplier issue. It am not sure whether my experience is a coincidence or an example of you get what you pay for.

Glen P. Davies

Another take on ink cartridges

The box test "Why ink costs so much" in part of the September Lab Report says printers have improved radically in the past two years while "cartridge prices have remained relatively stable".

I have two nearly identical Hewlett-Packard colour printers, an 812C bought about two years ago for \$250, and an 840C bought this summer for \$330. The

colour ink cartridges for both printers cost \$45. However, the 812C's cartridge comes with 30 ml of ink, while the 840C's cartridge comes with only 15 ml... Both have been refilled successfully more than once, and can hold a lot more than 30 ml.

Besides cosmetic changes (case colour) and the elimination of the parallel port, from the 840S, the main difference between these two printers is in quality control. The fit and finish of the 812C's parts is average, the 840S feels rough, and arrived with a crack where two parts of the paper tray are joined at the factory. Even the 840S' nameplate—reduced from the 840C's 3D plastic molding to just a piece of sticky paper—was cracked.

Alan Chatterley

TGP reader: your commentary reminds me that the color bar test should have said that printer pricing had improved in the past two years.

You left out FreeHand

In your review of Illustrator versus CorelDRAW, there was no mention of Macromedia's FreeHand which was always fighting with Illustrator for supremacy on Mac's side of the track and where CorelDRAW never had a chance. Both are available on either Mac or PC platform. We have to remember that FreeHand was

developed by Aldus, the same company that brought us PageMaker.

Later an Adobe bought up Aldus products, kept PageMaker, pushed it to version 5.5 then 7, left FreeHand standing still, forcing Illustrator to pre-empt, then sold it to Macromedia, which then updated it to version 9 and then to version 10, in early 2001.

FreeHand was and is still ahead of Illustrator in terms of integrating text to vector graphics, integrated blends earlier and I always felt that its learning curve was less steep than Illustrator's. And the legal battle between Adobe and Macromedia plays in part for what I understand from technology whetted from Adobe.

Louis Martin

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WHAT'S NEW

Vancouver-based **Breitley Media Technologies** (www.breitley.com) has released a prototype of its latest version of Breitneat, which will allow users to watch live streaming video through a Web site without plug-ins or third-party player software.

CyberLink TV is Java-based, and can be used to retransmit a live television signal or video signal to the desktop. According to Breitley Media, the stream will reach users behind firewalls or proxies that are compatible with HTML 3.2. A demo of the prototype is available at: www.breitley.com/demo/breitneat.html.

Canon (www.canon.ca) has introduced two compact projectors to its line that will allow users to project a 2.54 m wide (100 in.) image from 2.8 m (9.2 ft), which is about 3.2 m (4 ft) closer than Canon's previous model. The LV-7355 and LV-7356 LCD projectors, which weigh in at 4.2 kg, also feature native XGA resolution, a 1.5x magnified zoom lens, and the ability to connect wirelessly to a PC or to run a presentation directly from a media card.



Spotlight

LP to CD or DVD

Those with an interest in vinyl may be interested in the XP201—a \$199.95 and software solution for transforming analog vinyl records into digital audio files. The PhonoXP201 (www.phonoxp.com) has a built-in ROM equalizer and comes bundled with Wave Party software for editing the resulting audio files to specific formats, such as MP3s.

The product is made by **Phonoxp** (www.phonoxp.com), located in Melbourne, Australia. It is housed in a shielded chassis to prevent noise distortion or interference from the LP, and is powered by either a 9-Volt battery or a 9-Volt AC/DC adapter. While the hardware is compatible with Mac, Windows PC, and portable MP3 players, the XP201 has a suggested retail price of \$199.95.



access a server or Internet connection. Users can communicate through chat or instant messaging programs and transfer files between devices over the connection, according to the company.

The software supports Windows-based laptop, desktop, and tablet PCs, as well as both Palm and Pocket PC handhelds. It can be purchased from Colliger's Web site for US\$59.95.

IBM (www.ibm.com) and **Honda** (www.honda.com) are working on a voice recognition technology for a new navigation system that will be featured in select 2003 model Honda Accords. The new Touch by Voice navigation system is powered by IBM's Visorize technology and software developed jointly by IBM and Honda Research and Development.



Drivers will be able to activate the system through a "talk" button on the steering wheel, and then ask for directions and hear the responses over the car's audio system. In addition, IBM says drivers will be able to use the technology to operate the car's climate controls. The navigation system will be available on top-end Accord models sold in the U.S.

Intel (www.intel.com) and **SonicBlue** (www.sonicblue.com) have announced a joint plan to develop a mobile device that will play back recorded TV programs. The ReplayTV Portable Video Player (PVP) device, which is expected to be released in 2003, will play files transferred from SonicBlue's ReplayTV Digital Video Recorder, as well as other audio and video files transferred from a PC.

Intel is contributing its iScale technology-based processors and advanced video codecs developed by its Emerging Platform Lab, according to the announcement, which was made at the

Spotlight

Tiny children captures video day is here. Sony has unveiled a new class of ultra-small digital cameras, beginning with the Cyber-shot D-U50, D-U60 and D-U70. The tiny cameras capture both digital still images and record MP4 movie clips.

The Cyber-shot D-U70 weighs in at 121 g (4.2 oz.) each with battery and media installed. Using a Sony proprietary multi media card, the D-U70 models come with an 8 MB Memory Stick, as well as a pair of AAA NiMH rechargeable batteries, a battery charger, AV cable, and a carrying case.

They feature a user-friendly interface, built-in flash, and can be operated with one hand, according to Sony. They also have a 1-inch liquid reflective LCD. For computing and viewing shots.

In addition to standard still image capture, the new cameras feature a burst mode for shooting up to five consecutive frames (three per sec. only), while pausing the shutter to focus, and video mode for capturing 35 second MP4 3.1 mb (without audio).

The Cyber-shot D-U50/D-U60 is priced at US\$329.95 and the D-U70 at US\$349. Both models sport a silver finish case, but Sony says a wide range of case colors will be available in early 2003.

Intel Developer's Forum (IDF) in San Jose

The announcement begins with the general theme of connectivity Intel emphasized at the forum, which included a keynote presentation about the "digital home," in which computers and consumer electronic devices connect and communicate seamlessly.



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Still hurting after all these years

Pain on the job didn't start with the Computer Age

By Jeff Evans

I know three people who have developed repetitive strain injuries (RSI), associated with long term computer keyboard and mouse use. Their symptoms appeared years ago, when proper ergonomic methods of preventing RSIs were not widely known or practiced. They still suffer from symptoms, even though they now practice safer computing today.

Although accurate figures on the total numbers of RSI sufferers are hard to put down, my three friends have lots of company. In researching this article, I came across wildly varying statistics and estimates of the scale of the RSI problem, with the claimed numbers of sufferers of this condition ranging from hundreds of

thousands to many millions, in North America alone. Estimates of the economic costs of RSIs in North America also vary wildly, from \$2 billion to \$100 billion per year.

Work has always had its dangers: the slaving of a first century AD slave from the Roman city of Macellum had several varieties forced from the literally back-breaking labour he performed on the docks and ships of that port. Slave women used to wear out their front teeth in the course of a lifetime of chewing hides to soften them, a necessary step in making certain items of attire clothing. Some of my coal mining ancestors had "broken down the back," circles of scar tissue over the bungee of their vertebrae, created by years of scraping through tiny

stone tunnels, their bodies bent by the rough, low, rock ceilings.

The Computer Age poses hazards to today's information workers, just as the Stone Age, the Iron Age, and the Industrial Age challenged our ancestors. Sadly, many of today's technology-related problems are unnecessary, the result of new technologies not originally developed with human user needs sufficiently in mind. A lot of research and work has been done in the last decade, trying to make the deficiencies of too-hasty created information tools



Today, we call the scientific study of the tools and environments that we use and live within, "ergonomics." The term comes from the Greek ergos, (work) and nomos (law), or "laws of work." According to Donald Norman, an Apple

Continued on page 44

On our cover: the ultimate in workspace ergonomics



lucky chair

No, you can't buy the workstation that we selected to illustrate this month's cover. Called the Cliper CS-L, it was designed in 1994 by Douglas Bell and manufactured by Novus Inc. of Texas, but is no longer in production.

We first saw the Cliper being exhibited at the Design Exchange in Toronto, and have since learned that it was selected to be part of the permanent collection of the Design Museum in London.

The design can be likened to an airplane cockpit, where controls are readily accessible, and the space is private and personal. The white pat-

ent diffuses light, helping to eliminate glare and reflections on a computer monitor and the relationships between seating and desk can be customized.

Douglas Bell, born in Peterborough Ont., presently runs his own studio, Douglas Bell Inc. (www.douglasbell.com) based in St. Merric, Que. He worked for Surac, a well-known name in Canadian office furniture where he designed systems (e.g., Unisys lateral filing) that became standards for office furniture.

His latest creation is the Lucy chair, designed in 2000 and manufactured by Vecta



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< ECONOMICS >

Still hating after all these years

(Continued from page 12)

Follow and the writer of *Things That Make Us Smart: Defending Human Attributes in the Age of the Machine*, technology tends to obsolescence, and it requires a conscious effort to embrace it. In conversation with this writer, Norman expressed his love for the human ingenuity that has created modern technology, but warns that technology becomes so pervasive, and effects us subconsciously, that it can reduce or transform our beliefs without us knowing. The cure, according to Norman, is to always question technology, and to inquire and work to make it serve us, rather than us serve it. Perhaps the most powerful tool for this examination and control of our tools and environments is ergonomics.

Another term for ergonomics is human engineering, that is, engineering the species, information and tools that humans use for work, education, and play so they provide the greatest benefit. Ergonomics really started to become a scientific discipline in the first half of the 20th century, initially as part of industrial design and manufacturing process improvement, and later flourishing with the hyper-accelerated military-industrial design boom of World War II.

Early research into ergonomics and human factors relating to computer technology occurred at the RAND Corporation think tank in the 1960s and the MIT Media Lab, the Xerox PARC research lab, Stanford University, and Bell Labs, in the 1970s.

Work could hurt ya

Why care about ergonomics? Because the next victims of bad design might be you. Even before the computer revolution started, RSI from badly designed factory work or other laborious jobs were a major problem.

Repetitive actions such as lifting or twisting created unhealthy strain on the body's joints, muscles and nerves, causing initial pain, numbness, and weakness, and eventually resulting in permanent damage and disabilities to thousands of workers.

However, as office workers' use of electric typewriters, and data input workers' use of computer keyboards increased with the computerization of the late 1970s, the rates of reported RSI skyrocketed.

U.S. Bureau of Labour Statistics
Continued on page 18



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Still burning after all these years

Continued from page 14

showed a growing RSI trend, with a huge spike in the late 1990s as computer use exploded.

| Year | RSI cases | Percent of all diseases |
|------|-----------|-------------------------|
| 1980 | 20,300 | 14 percent |
| 1985 | 25,900 | 15 percent |
| 1990 | 33,200 | 16 percent |
| 1994 | 31,000 | 16 percent |
| 1995 | 22,900 | 21 percent |
| 1997 | 26,700 | 25 percent |

| | | |
|------|--------|------------|
| 1998 | 50,700 | 26 percent |
| 1999 | 52,000 | 26 percent |
| 2000 | 45,500 | 24 percent |
| 2001 | 72,500 | 38 percent |
| 2002 | 75,300 | 40 percent |
| 2003 | 45,000 | 32 percent |
| 2004 | 35,400 | 32 percent |

Source: Workplace Injury Prevention Council, Health & Safety Directorate, Ontario Ministry of Labour

Corporations had looked to computers for vast increases in efficiency and profitability. They looked on computer users as components of the new technology

logical solutions, not as human beings with physical limits and vulnerabilities. In the early days of computing, the emphasis was on keyboards instead, and work zones ignored the damage that millions of repeated actions could cause to sensitive human nerve, muscle, and connective tissues.

Computing was created by engineers, and implemented to increase profits. It sprang from a combination of engineering and accounting perspectives increased efficiency and profit were top

of mind, without much recognition of human factors.

The first personal computers were crude and poorly thought out from an ergonomic perspective they had a flat typewriter keyboard, and low-resolution monochrome screens that displayed text-only command line interfaces.

Productivity goals required that data entry workers sit for long periods on badly designed chairs, at front of badly designed desks, day after day employed

Continued on page 20



Computers

Office 211

ECS KISSA ATX MB

OptiPlex 740

DELL Dimension 4500

ATI Rage 128 Pro 256 MB

1.7GHz Celeron

RADEON 900 128 MB

Western ATX Case w/500W

Windows ME

Logitech Cordless Mouse

SteelSeries

Duron 1.3GHz — \$639

XP 1800+ — \$665

XP 1.7GHz — \$685

XP 1.8GHz — \$704

XP 1.9GHz — \$724

XP 2.0GHz — \$744

XP 2.1GHz — \$764

XP 2.2GHz — \$784

XP 2.3GHz — \$804

XP 2.4GHz — \$824

XP 2.5GHz — \$844

XP 2.6GHz — \$864

XP 2.7GHz — \$884

XP 2.8GHz — \$904

XP 2.9GHz — \$924

XP 3.0GHz — \$944

XP 3.1GHz — \$964

XP 3.2GHz — \$984

XP 3.3GHz — \$1,004

XP 3.4GHz — \$1,024

XP 3.5GHz — \$1,044

XP 3.6GHz — \$1,064

XP 3.7GHz — \$1,084

XP 3.8GHz — \$1,104

XP 3.9GHz — \$1,124

XP 4.0GHz — \$1,144

XP 4.1GHz — \$1,164

XP 4.2GHz — \$1,184

XP 4.3GHz — \$1,204

XP 4.4GHz — \$1,224

XP 4.5GHz — \$1,244

XP 4.6GHz — \$1,264

XP 4.7GHz — \$1,284

XP 4.8GHz — \$1,304

XP 4.9GHz — \$1,324

XP 5.0GHz — \$1,344

XP 5.1GHz — \$1,364

XP 5.2GHz — \$1,384

XP 5.3GHz — \$1,404

XP 5.4GHz — \$1,424

XP 5.5GHz — \$1,444

XP 5.6GHz — \$1,464

XP 5.7GHz — \$1,484

XP 5.8GHz — \$1,504

XP 5.9GHz — \$1,524

XP 6.0GHz — \$1,544

XP 6.1GHz — \$1,564

XP 6.2GHz — \$1,584

XP 6.3GHz — \$1,604

XP 6.4GHz — \$1,624

XP 6.5GHz — \$1,644

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self-hating after all these years.

Continued from page 28

and keystroke-counting software to objectively measure worker productivity. The notion of "idle theft" was applied to any non-productive worker activity, like going to the water cooler or walking around the office. The result? Over a period of 20 years, as computing became ubiquitous, chronic damage to workers' health also became very common.

The resulting health problems cannot be blamed on worker ignorance; they were a natural result of a poorly thought out computer equipment, work environments, and work processes; in short, a gross failure to think ergonomically, and to design work for the benefit of human beings.

Engagements in the research

The rising tide of health problems from poor computer ergonomics attracted the attention of government ministries of health throughout the industrial world, and stimulated action from occupational health and safety bodies. Together, ergonomics experts and government agencies devised and publicized ergonomic strategies for safer computing, and worked to have these adopted as workplace health

and safety standards in industry, education, and non-existent enclosures.

What really got the computer industry's attention, however, was a wave of litigation in the 1990s against employers and PC makers by workers with RSIs. Both employers and PC makers were initially slow to recognize and admit prob-

lens, especially where an admission of guilt might help nervous lawyers who are stiff-necked.

There was also a cultural problem related to industry's blindness about poor computing experiences. In the first generation of the Computer Age, senior execs didn't use PCs, and there was a

Rogue's gallery of ergonomic malfeasance

Display systems

- **Monitor placements:** Wrong distance, angle, or height can make it too close to comfortably view the entire screen, or too far to easily read text.
 - **Image quality:** Fuzzy display, inadequate colors, size for text, blinks from liquidcrystal or badly configured graphics card can be problematic.
 - **Reflections on screens:** Leads to eye strain and headaches.
 - **Emissions:** Most modern monitors meet stringent requirements on electromagnetic and radio frequency emissions, but there is still debate.

Indoor environmental quality

 - Among the indoor air contaminants found in a modern office or home office are asbestos and fibres; some types of insulation may contain asbestos.
 - Other common sources of indoor air pollution include cigarette smoke, radon, formaldehyde, volatile organic compounds (VOCs), and mold/mildew.
 - Indoor air pollutants may contribute to a number of problems including dizziness, eye or respiratory irritation, headaches, and fatigue.
 - Noise pollution from printers and other office equipment, fans, and disk drives.

Furniture and workstation

 - Tables and chairs at the wrong height and not adjustable.
 - Chairs not ergonomically designed for lower back support, leading to muscle and joint strain, back pain, circulatory problems, fatigue, and depression.

Keyboards and mice

 - Poor placement requiring unnatural body postures.

gender split in the user populations, most did information technology and engineering work with computers, while women were more likely to be doing the endlessly repetitive data processing and menial work—and suffered disproportionately from the ill effects of such work. □

angle between forearms and hands, leading to constant strain on ulnar

- Seating can impede spinal injuries.
 - Prior or no training in keyboarding, leading users to hit keys too hard, leading to damage to hands and wrists.
 - Clamped workspaces can mean mice are badly positioned, causing cramping and strain to mouse tail and arm.

Employment policies and practices

- Failure to allow/encourage regular breaks and variety of non-computer tasks, to prevent rest to eyes, tired from constant repetition.
 - Lack of health-promoting policies and work norms, lack of training of supervisors and workers in healthy computing and work habits.

—Jeff Evans

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